

AD-A047 777

ARMY ENVIRONMENTAL HYGIENE AGENCY ABERDEEN PROVING GR--ETC F/G 6/6
PESTICIDE MONITORING GUIDELINES, DEPARTMENT OF THE ARMY PESTICI--ETC(U)
DEC 77 J H VINOPAL, K L OLDS, J F SUPROCK

UNCLASSIFIED

USAHA-44-0142-78

NL

| OF |
AD
A047777



END
DATE
FILMED

1-78

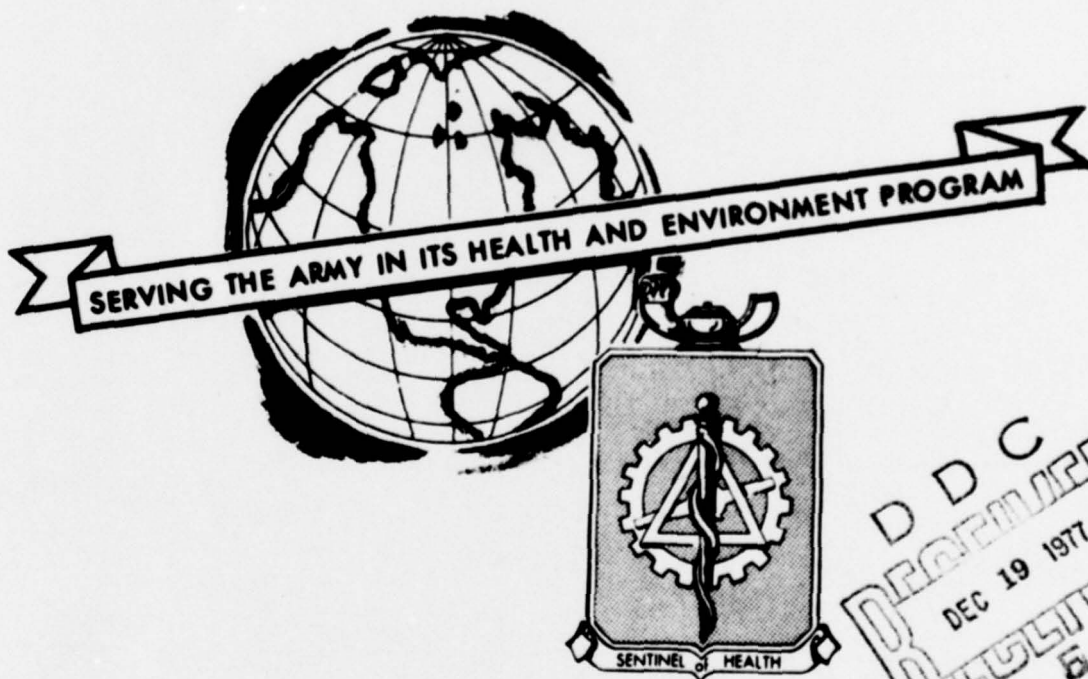
DDC

PESTICIDE MONITORING STUDY NO. 44-0142-78
PESTICIDE MONITORING GUIDELINES
DEPARTMENT OF THE ARMY PESTICIDE MONITORING PROGRAM
(EFFECTIVE 1 APRIL 1978)

12
SC

Approved for public release; distribution unlimited

AD A047777



DDC
RECEIVED
DEC 19 1977
REGISTERED

AD No. —
DDC FILE COPY

US ARMY
ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MD 21010



DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010

Dr. Vinopal/cf/584-2177

HSE-RP-MO/WP

9 DEC 1977

SUBJECT: Pesticide Monitoring Study No. 44-0142-78, Pesticide Monitoring Guidelines, Department of the Army Pesticide Monitoring Program (Effective 1 April 1978)

SEE DISTRIBUTION

A summary of the pertinent findings and recommendations of the inclosed report follows:

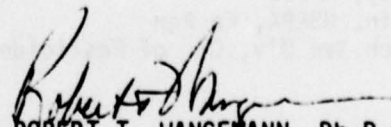
a. These guidelines contain sample stratification designs, sample collection procedures, sample container preparation and shipment procedures, and information for coding computer analysis report forms. A list of environmental components that will be sampled yearly at US Army installations for pesticide residue examinations under the Department of the Army Pesticide Monitoring Program (DAPMP) is included.

b. Evaluation of residue data from CY 1975 as well as other factors have necessitated several changes to the DAPMP. The number of US Army installations in the Program has been reduced from 33 to 12 which will represent most of the geographical regions of the continental US. Range/training, agricultural, grazing, and forest land stratifications have been eliminated because they contribute little to the overall soil pesticide profile. Residential and cantonment areas have been consolidated because there is little or no difference in their soil pesticide profile according to statistical analysis. Statistical analysis of residue data from the fish families Centrarchidae (top feeding group) and Ictaluridae (bottom feeding group) showed little difference between the two. Therefore, only one family, Ictaluridae, will be collected in the future.

c. These modifications serve as a major basis for the revision of the DAPMP. The integrity of the Program will not be compromised and it will continue to insure efficient reliable monitoring data to support pesticide and pest management program decisions.

FOR THE COMMANDER:

1 Incl
as


ROBERT T. WANGEMANN, Ph.D.
LTC(P), MSC
Director, Radiation and
Environmental Sciences

DISTRIBUTION: (see pg 2)

HSE-RP-MO/WP

SUBJECT: Pesticide Monitoring Study No. 44-0142-78, Pesticide Monitoring Guidelines, Department of the Army Pesticide Monitoring Program (Effective 1 April 1978)

DISTRIBUTION: (3 cy ea)

HQDA (DAEN-ZCE)

HQDA (DAEN-FEB)

HQDA (DASG-HCH)

COMMANDERS:

FORSCOM (AFEN-FE-S)

TRADOC (ATEN-FE-BG)

HSC (HSPA-H)

USACC (ACC-PA-S)

Ft Bragg (Fac Engr Dir)

Ft Carson (Fac Engr Dir)

Ft Devens (Fac Engr Dir)

Ft Huachuca (Fac Engr Dir)

Ft Jackson (Fac Engr Dir)

Ft Knox (Fac Engr Dir)

Ft Leonard Wood (Fac Engr Dir)

Ft Lewis (Fac Engr Dir)

Ft McCoy (Fac Engr Dir)

Ft Ord (Fac Engr Dir)

Ft Polk (Fac Engr Dir)

Ft Sam Houston (Fac Engr Dir)

MEDDAC, Ft Bragg (Ento)

MEDDAC, Ft Carson (HEV)

MEDDAC, Ft Devens (HEV)

MEDDAC, Ft Huachuca (HEV)

MEDDAC, Ft Jackson (Ento)

MEDDAC, Ft Knox (Ento)

MEDDAC, Ft Leonard Wood (Ento)

MEDDAC, Ft Ord (Ento)

MEDDAC, Ft Polk (Ento)

BAMC (Ento)

MAMC (Ento)

CF: (1 cy ea)

Cdr, DARCOM (DRC SG)

Cdr, DARCOM (DRCIS-BI-IB)

Supt, AHS (HSA-IHE)

Cdr, MEDDAC, Ft Sheridan (HEV)

Cdr, 10th Med Lab (AEMML-HE-ENT)

C, USAEHA-Rgn Div North

C, USAEHA-Rgn Div South

C, USAEHA-Rgn Div West

Exec Secy, AFPCB

Rgn Admin, USEPA, Ea Rgn

Dir, Tech Svc Div, Ofc of Pesticide Prog, USEPA

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER 44-0142-78 ✓	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Pesticide Monitoring Study No. 44-0142-78 Pesticide Monitoring Guidelines, Department of the Army Pesticide Monitoring Program (Effective 1 April 1978).		5. TYPE OF REPORT & PERIOD COVERED Special Report November 1977
6. PERFORMING ORG. REPORT NUMBER 44-0142-78		7. CONTRACT OR GRANT NUMBER(s)
8. AUTHOR(s) J. Howard Vinopal, Ph.D. Kenneth L. Olds John F. Suprock Thomas M. White		9. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
10. CONTROLLING OFFICE NAME AND ADDRESS Commander US Army Health Services Command Ft Sam Houston, TX 78234		11. REPORT DATE 9 December 1977
12. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) 12/28p.		13. NUMBER OF PAGES 23
14. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited (14) USAEHA-44-0142-78		15. SECURITY CLASS. (of this report) UNCLASSIFIED
16. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report) (9) Pesticide monitoring special study for period ending Nov 77.		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
17. SUPPLEMENTARY NOTES		
18. KEY WORDS (Continue on reverse side if necessary and identify by block number) Pesticides Sediment Sampling Monitoring Fish Design Environment Birds Stratification S Guidelines Residues		
19. 20. <i>Continue on reverse side if necessary and identify by block number</i> The following lines contain sample stratification designs, sample collection procedures, sample container preparation and shipment procedures, and information for coding computer analysis report forms. A list of environmental components that will be sampled yearly at US Army installations for pesticide residue examinations under the Department of the Army Pesticide Monitoring Program (DAPMP) is included. Evaluation of residue data from CY 1975 as well as other factors have necessitated several changes to the DAPMP. The number of US Army installations in the Program has been reduced from 33 to 12 which will represent most of the		

038 150

1B

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

20. ABSTRACT

4 geographical regions of the continental US. Range/training, agricultural, grazing, and forest land stratifications have been eliminated because they contribute little to the overall soil pesticide profile. Residential and cantonment areas have been consolidated because there is little or no difference in their soil pesticide profile according to statistical analysis. Statistical analysis of residue data from the fish families Centrarchidae (top feeding group) and Ictaluridae (bottom feeding group) showed little difference between the two. Therefore, only one family, Ictaluridae, will be collected in the future. These modifications serve as a major basis for the revision of the DAPMP. The integrity of the Program will not be compromised and it will continue to insure efficient reliable monitoring data to support pesticide and pest management program decisions.

ACCESSION for	
WTS	White Section <input checked="" type="checkbox"/>
ODC	Buff Section <input type="checkbox"/>
UNANNOUNCED	
JUSTIFICATION	
BY	
DISCLOSURE/PROPERTY CODES	
D.	SPECIAL
A	

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)



HSE-RP-MO/WP

DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010

PESTICIDE MONITORING STUDY NO. 44-0142-78
PESTICIDE MONITORING GUIDELINES*
DEPARTMENT OF THE ARMY PESTICIDE MONITORING PROGRAM
(EFFECTIVE 1 APRIL 1978)

1. AUTHORITY.

- a. AR 40-5, Health and Environment, 25 September 1974.
- b. AR 200-1, Environmental Protection and Enhancement, 7 December 1973.

2. REFERENCES.

- a. Public Law 92-516, Federal Environmental Pesticide Control Act of 1972, 21 October 1972, as amended by Public Law 94-140, 28 November 1975.
- b. Letter, HSE-RE/WP, US Army Environmental Hygiene Agency, 2 May 1975, subject: Implementation of the Revised DA Pesticide Monitoring Program.
- c. USAEHA Entomological Special Study No. 44-004-74/75, Revised Department of the Army Pesticide Monitoring Program, 1 April 1975, Natl Tech Inform Serv, ADA 004 030, 38 p, 1975.
- d. Pesticide Monitoring Special Study No. 44-111-76, Pesticide Monitoring Guidelines, Scheduled Monitoring (Effective 1 April 1976), Natl Tech Inform Serv, ADA 019 983, 29 p, 1976.
- e. USAEHA Pesticide Monitoring Special Study No. 44-0100-77, Department of the Army Pesticide Monitoring Program, Interim Evaluation of Soil and Sediment Samples Collected in CY 1975 from Fourteen Installations, January-December 1976, Natl Tech Inform Serv, ADA 036 998, 11 p, 1977.

3. PURPOSE. To revise and supplement the Department of the Army Pesticide Monitoring Program (DAPMP) to provide for a more efficient continuing assessment of the environmental impact of pesticide use by the Army.

4. GENERAL.

- a. The above references assign responsibilities and establish procedures to assure the detection of prospective environmental impacts.

* Superseded this Agency's Pesticide Monitoring Special Study No. 44-111-76 (effective 1 April 1976).

Pest Monitrg Study No. 44-0142-78 (Effective 1 April 1978)

b. The pesticide monitoring program will provide Department of the Army command and technical echelons with a continuing evaluation of their integrated pest management programs so that the pesticide component may be optimized.

c. The pesticide monitoring program will have interrelated and interdependent components as follows:

(1) Evaluation of pesticide use reports, DD Form 1532, to determine current and historical patterns of pesticide uses in connection with integrated pest management programs.

(2) Scheduled sampling and examination of designated environmental components from selected Army installations.

(3) Special sampling and examination of pertinent environmental components from any Army installation where circumstances warrant or require such information. Monitoring will be provided for each of the three major commands; US Army Forces Command, US Army Training and Doctrine Command and USA Materiel Development and Readiness Command, not to exceed one installation per command for each year. This sampling will be done by the Pesticide Monitoring Branch, but is incumbent upon funding being provided by the requesting command.

d. The environmental information acquired through this program will be:

(1) Integrated with compatible results from the National Pesticide Monitoring Programs.

(2) A basis for modification of the Army's integrated pest management programs to assure optimum management of pest populations with minimum environmental disruptions.

(3) A basis for storage, use and disposal of pesticides, pesticide related wastes, and pesticide containers so as to assure minimum environmental impact.

e. The dynamic state of the laboratory arts and sciences, and the incomplete understanding of the complex interactions of all components of man's environment, will require continuing modifications of this pesticide monitoring program so as to make available sound information as a basis for decision making that will:

(1) Preserve and protect the environment.

(2) Minimize human mortality and morbidity associated with invertebrate and vertebrate animals and a variety of plant pests.

Pest Monitg Study No. 44-0142-78 (Effective 1 April 1978)

(3) Protect and preserve the property and material entrusted to and required by the Army.

(4) Eliminate or minimize the unwarranted adverse environmental impacts of pesticide use.

5. BASIS FOR REVISION.

a. The decision to use any pest management system, whether or not a pesticide is an essential or incidental component of the system, recognizes an intended environmental change of a controlled spatial and temporal distribution.

b. The unusual susceptibility of DDT, its degradation products and several other pesticides and their degradation products to qualitative and quantitative detection has provided ample evidence that the spatial and temporal distribution of a pesticide, following its deliberate introduction, may be difficult to predict let alone control.

(1) The use of presumably less persistent pesticides as a component of pest management systems will require more frequent application of such pesticides if the required efficiency of the pest management system is to be maintained.

(2) The possibility for accumulation of such nonpersistent pesticides, metabolites and/or their effects has not been completely assessed.

c. Historical and current information concerning the deliberate spatial and temporal introduction of pesticides into the environment are essential to the design and execution of a pesticide monitoring program that exists to provide decision making information.

d. The most sophisticated laboratory technology can only be directly related to the actual sample examined in the laboratory.

(1) The sampling design is a critical component of this monitoring program.

(2) The techniques employed in executing the sampling design, if not consistent with the design intent, will invalidate all other effort expended.

(3) The ancillary information required in evaluating and interpreting the pesticide residue results must be complete and accompany the sample from the field.

6. SCHEDULED ENVIRONMENTAL COMPONENTS AND SELECTED INSTALLATIONS.

a. Soil, sediment, fish and birds are the environmental components designated for collection and examination to estimate the distribution and nature of pesticides in the environment. Several of these components, in view of our knowledge of pesticide use patterns, must be deliberately stratified.

(1) Land use and the nature of the land dictates pesticide use and requires the following stratifications for soil sampling:

- (a) Residential/cantonment areas.
- (b) Golf courses.
- (c) Other recreational areas.
- (d) Landfill areas.
- (e) Pesticide disposal areas.
- (f) Pesticide shop and storage areas.
- (g) Sewage treatment plants.

(2) Sediment stratification is dictated by the surface water situation. Sampling and examination of this component can reflect pesticide introduction to both the terrestrial and aquatic environments. The following sediment stratifications are used:

- (a) Impounded bodies of water.
- (b) Flowing streams.

(3) A nonmigratory bird, the starling, has been designated as the most appropriate terrestrial vertebrate "consumer" to be sampled and examined as an indicator of contamination.

(4) Fish have been designated as the aquatic vertebrate "consumer" to be sampled and examined as an indicator of pollution. Conservation of sampling and analytical effort dictate deliberate stratification to one family. Fish are collected from the two types of aquatic environments.

b. A statistically random selection of the locations from which these environmental components should be collected is a theoretical ideal. Several practical constraints mitigate against this theoretical approach.

Pest Monitg Study No. 44-0142-78 (Effective 1 April 1978)

- (1) Sampling must be restricted to Army installations.
- (2) The Army installations to be sampled must have available all of the designated environmental components if a variety of comparisons for purposes of pattern recognition are anticipated.
- (3) An active installation with an intensive and extensive pest management program provides a greater probability of detecting unanticipated spatial and temporal distribution of pesticides, their metabolites or their effects.
- (4) The number of installations to be selected must provide an adequate number of samples and be consistent with the logistical and laboratory capabilities of the responsible agency.
- (5) The installations comprising the scheduled sampling of the DAPMP network are listed in Table 1. The environmental components to be sampled at each installation are listed in Table 2. All environmental components are sampled annually at each installation.

TABLE 1. INSTALLATIONS SCHEDULED FOR SAMPLING ON AN ANNUAL BASIS

	<u>ARLOC</u>
Ft Lewis, WA	53456
Ft Ord, CA	06653
Ft Huachuca, AZ	04289
Ft Carson, CO	08135
Ft Leonard Wood, MO	29977
Ft McCoy, WI	55533
Ft Bragg, NC	37099
Ft Knox, KY	21478
Ft Devens, MA	25176
Ft Jackson, SC	45404
Ft Polk, LA	22722
Ft Sam Houston, TX	48399

TABLE 2. ENVIRONMENTAL COMPONENTS SAMPLED ANNUALLY AT SCHEDULED INSTALLATIONS

Soil/residential/cantonment areas
 Soil/golf courses
 Soil/recreational areas
 Soil/landfill areas
 Soil/pesticide disposal areas
 Soil/pesticide shop & storage areas
 Soil/sewage treatment plants
 Sediment/impounded
 Sediment/flowing/entrance
 Sediment/flowing/exit
 Fish/impounded water
 Fish/flowing water
 Starlings

7. COLLECTION OF ENVIRONMENTAL COMPONENTS FOR PESTICIDE RESIDUE EXAMINATION.

a. General. The validity of the results obtained from the DAPMP is directly related to the attention to detail of sample collection procedures. Standardization of sample collections will give confidence in and comparability of results. The aim of this program is to evaluate the pesticide residues in samples which should be representative of the universe from which they were collected. The evaluation of the interrelationship of residues among the various environmental components has great significance in any conclusions drawn from the data. Therefore, it is essential that care be exercised in the collection procedures employed. This program will routinely examine environmental samples from only a few large installations; data generated from these installations will be helpful in predicting pesticide levels in similar components at other installations.

b. Sample Stratification Design.

(1) The necessity for, and the nature of, the stratification of the soil and sediment components of the scheduled program have been discussed. Some basic definition regarding sample stratification are given below:

- (a) The sampling location is defined as the scheduled installation.
- (b) A sampling area is a definitive land use area, whether or not contiguous in its entirety.
- (c) A sampling site is a randomly selected subunit of the area.
- (d) A sampling point is the actual point of insertion of the sampling device.

(2) The number of randomly selected sampling sites must be determined by the total extent of the land use stratification. The general minimum number of sites for the various land uses are:

- (a) Group I. One site per area

Pesticide Shop and Storage Areas

Pesticide disposal/sewage treatment/landfill areas

Pest Monitg Study No. 44-0142-78 (Effective 1 April 1978)

(b) Group II. Three sites per area

Residential/cantonment areas
Golf courses
Other Recreational areas

(3) The size of the sites from which soil samples will be collected must also be related to the extent of the area. In general, these sizes should be as follows:

(a) Group I. The entire area will comprise the site.

(b) Group II. The sites should be approximately one-fourth of a hectare. (About one-half of a football field.)

(4) The number of soil cores to be collected and composited for each site are as follows:

(a) Group I - 10 cores.

(b) Group II - 10 cores.

(5) Land use areas. Bodies of water and specific sampling sites are determined using appropriate installation maps as follows:

(a) Land use areas and bodies of water are determined from the 1:50,000 and 1:24,000 scale installation maps.

(b) Sampling sites, as appropriate for the land use areas, are determined by a statistically random procedure and indicated on the 1:24,000 and appropriate 1:400 scale maps.

c. Responsibility.

(1) US Army Environmental Hygiene Agency-Pesticide Monitoring Branch (USAEHA-PMOB) is responsible for the preparation of detailed individual installations environmental sampling plans and dissemination of these sampling plans to collection personnel.

(2) USAEHA-PMOB is responsible for providing shipping containers, report forms, sample labels, soil and sediment collection equipment, and collection guidelines to the installation Facilities Engineering Directorate.

(3) USAEHA-PMOB personnel will provide on site training in collection procedures during the Spring (April - June) of 1978 and as frequently as required thereafter.

(4) The installation Facilities Engineering Directorate in coordination with appropriate MEDDAC/MEDCEN personnel, is responsible for making collections in accordance with the sampling plan and collection procedures.

(5) USAEHA-PMOB is responsible for pesticide residue examinations, data interpretation, and preparation and dissemination of monitoring reports.

d. Sample Container Preparations and Labelling.

(1) Glass containers received from USAEHA-PMOB will not require additional cleaning by the collector. However, the collector should visually inspect the cap to insure that a Teflon® liner is present and has achieved a proper fit.

(2) Particular attention must be given to the individual installation sampling plan, the completion of Part I of the Sampling and Analysis Report Form (USAEHA Form 102, 7 Jan 77), and the use of the code lists for this form.

(a) Part I of Sampling and Analysis Report Form will be filled out by the collector, placed inside the plastic envelopes provided, and packed with the sample for shipment to USAEHA.

(b) Code lists required in filling out subparts 1-5 and 7 of Part I of the Sampling and Analysis Report Form, together with a reproducible copy of this form, will be found in the Appendix. Sample Number Codes (Subpart 6 of Part I of the Sampling and Analysis Report Form) will be found in the individual installation environmental sampling plan.

(c) The collector will affix a properly completed label (supplied by USAEHA-PMOB) to each sample submitted for analysis. The sample number code (corresponding to the sample number code shown in subpart 6 of Part I of the Sampling and Analysis Report Form) must be on the sample container label.

(d) The collector should maintain a log of all environmental samples shipped in connection with this program.

e. Sample Collection Procedures.

(1) Soil. This is not merely a collection of a bottle full of dirt!

(a) Soil samples will be collected using a standard bulb planter or other suitable samplers.

© Teflon is a registered trademark of E. I. DuPont de Nemours and Co., Inc., Wilmington, DE. Use of trademarked name does not imply endorsement by the US Army, but is used only to assist in identification of a specific product.

Pest Montrg Study No. 44-0142-78 (Effective 1 April 1978)

(b) Samplers should be used in accordance with the manufacturers instructions. When a sufficient number of soil cores have been collected, thoroughly mix all cores and place a 1 quart (or 2 quarts where specified) aliquot of the sample into a glass sample collection jar.

(c) Mixing of soil cores should be done in a stainless steel or galvanized metal bucket. A plastic container should not be used. The bucket, brass screen sieve and bulb planter should be rinsed with water to minimize cross contamination of soil samples from one land use area with those from another land use area. The preferred sampling approach is to sample, in turn, from land use areas of less likely pesticide contamination (e.g., recreational areas) to land use areas of most likely pesticide contamination (e.g., pesticide shop, storage areas).

(2) Sediment. Bottom sediment samples, collected at the sites indicated in the installation sampling plan, serve a critical historical role in reflecting inputs to impounded and flowing bodies of water.

(a) Sediment samples will be collected using a Ekman Bottom Sampler or other appropriate sampler.

(b) Samplers should be used in accordance with the manufacturers instructions. Be sure jar is at least three-fourths full of solids exclusive of rocks, pebbles and plant debris and is firmly sealed and properly labeled.

(3) Fish.

(a) Fish samples will be collected from the same sites from which the sediment samples are collected. Representative fish from the family Ictaluridae (catfish family) should be collected in the DAPMP. In the event that this family is not available for collection the family Catostomidae (sucker family) may be substituted. Should neither of the above families be available, then representative fish of the family Centrarchidae (sunfish and bass family) will be acceptable. A minimum of five fish with a total weight of at least 1 kilogram must be submitted.

(b) Installation collection personnel are responsible for securing necessary Scientific Collection Permits. Fish collections may require special equipment which is not easily transported (i.e., boots). Additionally, weather conditions may not always be conducive to collecting fish. For these reasons, it is strongly recommended that the assistance of appropriate State, Federal or installation Fish and Wildlife personnel be solicited.

(c) Collect fish samples with the aid of a gill net or seines. The gill net should be at least 6 feet deep, with a mesh size of 2 inches. The bag seine should measure approximately 6 x 6 x 6 feet.

- (d) Freeze collected fish as soon as possible.
 - (e) Wrap frozen samples in aluminum foil.
 - (f) Place foil-wrapped fish in polyethylene bags.
 - (g) The polyethylene bags containing the fish are then placed between two slabs of dry ice in the special biological shipping container (supplied by USAEHA-PMOB). All dead space should be filled with insulating material to minimize heat transfer.
 - (h) Place the Sampling and Analysis Report Form, with Part I completely filled out in the plastic envelope provided. Then tape the envelope to the top of the inner lid of the shipping container - do not place the report form in direct contact with the sample where it may become wet and deteriorate. Seal shipping box securely.
- (4) Starlings.
- (a) Due to the variable flocking nature of starlings at an installation, there will be no time constraints placed upon the collection of starlings by USAEHA, although as mentioned in paragraph 4(f) below it would be preferable to collect the birds in the spring. If collection in the spring is not feasible then starlings should be collected during the month when they are found to be most numerous locally. In the event, that starlings cannot be collected anytime during the year then English sparrows may be substituted. Installation collection personnel are responsible for securing any required Scientific Collection Permits.
 - (b) As with the fish samples, the aid of appropriate State, Federal or installation Fish and Wildlife personnel should be enlisted for the collection of the starling samples. The most efficient method for collecting starlings is by shooting them with a shotgun. If shotguns are used, and Fish and Wildlife personnel are not doing the collecting, clearance must be obtained from post military police and/or security personnel.
 - (c) Each installation's starling sample should be comprised of at least ten birds.
 - (d) Collected starlings must be frozen as soon as possible, wrapped in aluminum foil and place in a polyethylene bag.
 - (e) A properly completed sample label will be affixed to each sample.
 - (f) The sample will be placed between two slabs of dry ice in the special biological specimen box. All dead space will be filled with newspaper or like material to minimize heat transfer.

Pest Monitrg Study No. 44-0142-78 (Effective 1 April 1978)

(g) Place the Sampling and Analysis Report Form, with Part I completely filled out in the plastic envelope provided. Then tape the envelope to the top of the inner lid of the shipping container - do not place the report form in direct contact with the sample where it may become wet and deteriorate. Seal shipping box securely.

f. Time of Collection. The timing of sample collection should be consistent from year to year.

(1) Soil and sediment samples should be collected during April and May of each year.

(2) Fish and bird samples should be preferably collected during the spring each year. The specific times will be regulated by such factors as the flocking behavoir of starlings, etc.

g. Shipment of Samples.

(1) Fish and bird samples collected for the DAPMP should be shipped via air freight using a service such as Emery Air Freight or any other expedited Air Freight Service, to Transportation Officer, USAEHA, Building E-2100, Edgewood Area, Aberdeen Proving Ground, MD 21010. The service selected should offer not greater than 48 hours pick-up to delivery time. Delivery to Building E-2100 is essential and justified in view of the costs of collection and the ultimate analytical costs. If funds are not available for expedited air freight, a fund cite can be obtained from USAEHA by providing the local Transportation Officer's name and phone number. The fund cite will be called to him from USAEHA.

(2) Soil and sediment samples should be shipped via US Mail to Commander, USAEHA, ATTN: HSE-RP-MO, Aberdeen Proving Ground, MD 21010.

8. REPORTS.

a. Two types of yearly reports that summarize and interpret the analytical and environmental data will be prepared.

(1) Summarized data will be contrasted on a temporal basis within the Army wide data set. The Army wide data will also be evaluated in contrast with other applicable monitoring literature.

(2) Environmental data from each scheduled monitoring installation will be evaluated and interpreted on both spatial and temporal bases to ascertain the effectiveness of pesticide management practices in minimizing adverse environmental impacts.

Pest Montrg Study No. 44-0142-78 (Effective 1 April 1978)

b. Special reports, on nonscheduled installations selected on a random basis or in connection with a specific situation or incident, will be prepared as appropriate with particular emphasis on pesticide management techniques as they relate to unwarranted environmental impacts.

J. Howard Vinopal

J. HOWARD VINOPAL, Ph.D.
Program Manager
Department of the Army
Pesticide Monitoring Program

Kenneth L. Olds

KENNETH L. OLDS
Entomologist
Pest Management & Pesticide
Monitoring Division

John F. Suprock

JOHN F. SUPROCK
Entomologist
Pest Management & Pesticide
Monitoring Division

Thomas M. White

THOMAS M. WHITE
Biological Technician
Pest Management & Pesticide
Monitoring Division

APPROVED:

Joseph T. Whitlaw, Jr.

JOSEPH T. WHITLAW, JR.
LTC, MSC
Chief, Pest Management & Pesticide
Monitoring Division

Pest Monitrg Study No. 44-0142-78 (Effective 1 April 1978)

APPENDIX

DEPARTMENT OF THE ARMY
PESTICIDE MONITORING PROGRAM
CODING LISTS
1 JANUARY 1978

For use of this form see USAENA Pesticide Monitoring Guidelines

Pest Monitrg Study No. 44-0142-78 (Effective 1 April 1978)

Code 1 INSTALLATION

Use five digit ARLOC designator found in DA Pamphlet 525-12

Code 2 SITE

- 100 Stream
- 101 Entrance into installation
- 102 Exit from installation
- 200 Impounded body of water
- 201 Lake or pond without well defined influent and effluent
- 202 Lake or pond with well defined influent and effluent
- 300 Bay, estuary or other body of water subject to ocean tides
- 400 Pesticide disposal area
- 401 Sewage treatment area
- 402 Landfill area
- 403 Pesticide storage area
- 404 Pesticide shop area
- 405 Combination pesticide shop/storage area
- 406 Herbicide storage area
- 407 Herbicide shop area
- 408 Combined herbicide storage/shop area
- 410 Residential areas
- 411 Cantonment areas
- 412 Recreation areas
- 413 Golf courses
- 414 Composite residential/cantonment
- 415 Special recreation areas (picnic, golf, athletic fields)
- 416 Special cantonment areas (residential/industrial)
- 417 Special disposal areas (disposal/sanitary landfills)
- 421 Grazing, forests and agricultural
- 422 Range and training
- 460 Random samples
- 500 Unknown
- 600 Ocean
- 700 Special soil
- 710 Special sediment
- 720 Special Water

Code 3 TYPE

- 01 Water
- 02 Soil
- 03 Sediment
- 04 Fish
- 05 Bird

Pest Monitg Study No. 44-0142-78 (Effective 1 April 1978)

- 06 Unknown pesticides
- 07 Ground water
- 08 Unknown liquids
- 09 Foods
- 10 Air
- 11 Sewage
- 12 Mammals
- 13 Other vertebrates
- 14 Foliage
- 15 Aquatic organisms
- 16 Unknown compounds
- 17 Invertebrates
- 18 Reptiles
- 19 Amphibians
- 20 Pesticide formulations
- 99 Miscellaneous

Code 4 TAXONOMIC CODE

- 00 Not Applicable. No print-out
- 10 Birds
- 11 Sturnidae (Starlings)
- 12 Icteridae (Blackbirds, Grackles)
- 13 Ploceidae (English Sparrows)
- 20 Fish
- 25 Centrarchidae (Sunfish, Bass)
- 26 Lepomis
- 27 Pomoxis
- 28 Micropterus
- 30 Esocidae (Pike, Pickerel)
- 31 Esox
- 35 Percidae (perch)
- 36 Stizostedion
- 37 Perca
- 40 Serranidae (Sea Bass)
- 41 Roccus
- 45 Salmonidae (Salmon, Trout, Whitefish)
- 46 Salmo
- 47 Oncorhynchus
- 48 Salvelinus
- 49 Thymallus
- 50 Osmeridae (Smelt)
- 51 Osmerus
- 55 Hiodontidae (Mooneye, Goldeye)
- 56 Hiodon
- 60 Ictaluridae (Catfish, Bullhead)
- 61 Ictalurus

Pest Monitg Study No. 44-0142-78 (Effective 1 April 1978)

- 62 Pylodictis
- 65 Sciaenidae (Drums)
- 66 Aplodinotus
- 70 Catostomidae (Suckers)
- 71 Catostomus
- 72 Moxostoma
- 75 Lepisosteidae (Gar)
- 76 Lepisosteus
- 80 Cyprinidae (Carp, Minnow)
- 81 Cyprinus
- 82 Ptychocheilus
- 83 Clupeidae
- 84 Anguillidae

Code 11 TYPE OF ANALYSIS

- 01 Gas Chromatography
- 02 Spectrophotometric - UV or visible
- 03 Spectrophotometric - IR
- 04 Mass Spectrometry
- 05 GC-Mass Spectrometry
- 06 TLC (Thin Layer Chromatography)
- 07 Bioassay
- 08 Liquid Chromatography
- 10 A. A. Heavy Metals
- 20 X-ray Spectroscopy Heavy Metals

Code 12 PMP CONFIRMATION CODES

Thin Layer Chromatography (TLC)	1	0	0
Coulson (COUL)	2	0	0
Flame Photometric (FPD)	3	0	0
Alternate Column (AC)	4	0	0
GLC CO-Chromatography (CC)	5	0	0
P-Values (PV)	6	0	0
Derivatization (DEV)	7	0	0
GC Mass Spectrometry (MS)	8	0	0
Other*	9	0	0

Example of Multiple Confirmation Coding

Coulson + FPD	2	3	0
Coulson + FPD + TLC	1	2	3

All other combinations follow the above procedure.

* Used if methods other than those listed above are employed or if more than three methods are used.

PART III PESTICIDES ANALYZED FOR/GROUP CODES

Group 001

100 - o,p'-DDD
101 - p,p'-DDD
102 - o,p'-DDE
103 - p,p'-DDE
104 - o,p'-DDT
105 - p,p'-DDT
106 - methoxychlor
110 - oxychlordan
111 - aldrin
112 - chlordan
113 - dieldrin
115 - endrin
116 - heptachlor
117 - heptachlor epoxide
120 - toxaphene
121 - trans-chlordan
122 - cis-chlordan
123 - α -BHC
124 - β -BHC
125 - lindane
142 - malathion
145 - methyl parathion
153 - ronnel
165 - chlorpyrifos (Dursban)
169 - diazinon
175 - parathion
259 - mirex

Group 002

241 - 2,4-D and esters
242 - 2,4,5-T and esters
239 - Silvex

Group 003

246 - Aroclor 1221
247 - Aroclor 1242
248 - Aroclor 1248
249 - Aroclor 1254
250 - Aroclor 1260
251 - Aroclor 1262
252 - Aroclor 1232

Pest Monitg Study No. 44-0142-78 (Effective 1 April 1978)

Group 004

198 - carbaryl
208 - propoxur

Group 005

262 - pentachlorophenol

Group 006

100 - o,p'-DDD
101 - p,p'-DDD
102 - o,p'-DDE
103 - p,p'-DDE
104 - o,p'-DDT
105 - p,p'-DDT

Group 007

165 - chlorpyrifos
182 - chlorpyrifos oxon
169 - diazinon
183 - diazoxon
142 - malathion
155 - malaaxon
145 - methyl parathion
153 - ronnel
156 - methyl paraoxon
175 - parathion
184 - paraoxon

Group 008

Routine 2 Group 001 minus DDT's

Group 009

Routine 3 Group 001 minus malathion

Group 010

Routine 4 Group 001 minus malathion and DDT's

Group 998

Special group

PART IV PESTICIDE CLASS CODES

Class 01 - DDT Class

- 100 - o,p'-DDD
- 101 - p,p'-DDD
- 102 - o,p'-DDE
- 103 - p,p'-DDE
- 104 - o,p'-DDT
- 105 - p,p'-DDT
- 301 - o,p'-DDA
- 302 - p,p'-DDA
- 303 - o,p'-DDMU
- 304 - p,p'-DDMU

Class 01 - Cyclodiene Class

- 110 - oxychlordane
- 111 - aldrin
- 112 - chlordane
- 113 - dieldrin
- 114 - endosulfan
- 115 - endrin
- 116 - heptachlor
- 117 - heptachlor epoxide
- 118 - isobenzan
- 119 - isodrin
- 120 - toxaphene
- 121 - trans-chlordane
- 122 - cis-chlordane
- 310 - cis-nonachlor
- 311 - trans-nonachlor
- 312 - 1-hydroxychlordene
- 313 - photodieldrin A

Class 03 - BHC Class

- 123 - α -BHC
- 124 - β -BHC
- 125 - lindane
- 126 - δ -BHC

Class 04 - Other Organochlorine Insecticides Class

- 106 - methoxychlor
- 107 - Perthane
- 108 - dicofol

Pest Monitrg Study No. 44-0142-78 (Effective 1 April 1978)

109 -
255 - chlorbenside
257 - kepone
259 - mirex
262 - pentachlorophenol
320 - HCB

Class 05 - Organophosphorus Insecticides Class

All numbers 127 - 194

Class 06 - Carbamate Insecticides Class

All numbers 195 - 219

Class 07 - Phenoxy Herbicides Class

239 - silvex
241 - 2,4-D and esters
242 - 2,4,5-T and esters

Class 08 - Urea Herbicides Class

235 - Diuron
236 - Fenuron
237 - Monuron
243 - Siduron

Class 09 - Triazoles, Triazines Class

228 - Amitrole
244 - Atrazine
240 - Simazine

Class 10 - Herbicide Class

All numbrs under Class 07, Class 08 and Class 09

229 - Bromacil
230 - Cacodylic acid
231 - Dacthal
232 - Dalapon
233 - Dicamba
234 - Diquat
238 - Picloram
245 - Bensulide

Pest Monitg Study No. 44-0142-78 (Effective 1 April 1978)

Class 11 - Pyrethrin Class

- 220 - allethrin
- 221 - dimethrin
- 222 - pyrethrins
- 223 - resmethrin
- 224 - tetramethrin
- 225 - bioresmethrin
- 226 -
- 227 -

Class 12 - Heavy Metals Class

- 268 - Arsenic
- 269 - Antimony
- 270 - Bismuth
- 271 - Cadmium
- 272 - Copper
- 273 - Lead
- 274 - Mercury
- 275 - Tin
- 276 - Zinc
- 277 -
- 278 -
- 279 -
- 280 -

Class 13 - Repellents Class

Class 14 - Fungicide Class

Class 15 - Rodenticide Class

Class 16 - PCB Class

- 246 - Aroclor 1221
- 247 - Aroclor 1242
- 248 - Aroclor 1248
- 249 - Aroclor 1254
- 250 - Aroclor 1260
- 251 - Aroclor 1262
- 252 - Aroclor 1232
- 253 -

Pest Monitg Study No. 44-0142-78 (Effective 1 April 1978)

Class 17 - Misc Organic Pesticides

254 - Aramite
256 - dinocap
258 - lethane
261 - thanite
263 -
264 -
265 -
266 -
267 -